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EXAMINER

ORTIZ, EDGARDO

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 09/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.  
**09/343,293**

Applicant(s)  
**Cheng Et.al.**

Examiner  
**Edgardo Ortiz**

Art Unit  
**2815**



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on Aug 19, 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 63-76 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 63-76 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some\* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 28 6) ☐ Other:

Art Unit: 2815

### **DETAILED ACTION**

This Office Action is in response to a request for continued prosecution filed August 19, 2003.

#### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b).

Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 63-76 are rejected under 35 U.S.C. § 102 (e) as being anticipated by Hause et.al. (U.S. Patent No. 6,255,703). With regard to Claim 63, Hause teaches a substrate (405), a gate electrode (410) formed over the substrate and defining an underlying channel region in the substrate, said gate electrode having a barrier layer (555) formed on a sidewall of the gate electrode to prohibit silicidation of the sidewall, a source/drain extension (420) formed in the substrate adjacent the

Art Unit: 2815

gate electrode and encroaching laterally into the underlying channel region a first distance, the source/drain extension having a first silicide layer (1040) formed therein, the first silicide encroaching laterally into the underlying channel region a second distance less than the first distance, and a source/drain region (755) formed in the substrate adjacent the source/drain extension and having an activated doped region with a second silicide layer (1380) disposed therein and wherein the activated doped region and the first silicide are aligned with a spacer (1150) disposed along sidewalls of the gate electrode such that the activated doped region and the second silicide layer encroach laterally into the underlying channel region a third distance less than the second distance, said source/drain extension (420) having less dopant concentration (LDD) than the activated doped region. See figure 13.

With regard to Claim 64, Hause teaches an activated doped region (755) that is thicker than the source/drain extension (420). See figure 13.

With regard to Claim 65, Hause teaches a second silicide layer (1380) that is thicker the first silicide layer (1040). See figure 13.

With regard to Claim 66, Hause teaches an activated doped region (755) and a source/drain extension (420) that comprise implanted material (column 4, lines 45-50 and column 6, lines 54-56). The limitation of "*ion implanted* material" is a product by process limitation, a "product by

Art Unit: 2815

process" claim is directed to the product per se, no matter how actually made, In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ 161; In re Wertheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); In re Marosi et al, 218 USPQ 289; and particularly In re Thorpe, 227 USPQ 964, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above case law makes clear.

With regard to Claims 67 and 68, Hause teaches first (1040) and second (1380) silicide layers that can comprise either the same or different metals (column 7, lines 34-52).

With regard to Claims 69-73, Hause teaches first (1040) and second (1380) silicide layers that can comprise  $\text{CoSi}_2$ ,  $\text{TiSi}_2$  or nickel silicide (column 7, lines 34-52).

With regard to Claim 74, Hause teaches a gate electrode (410) having a third silicide layer (1040) formed on the top surface of the gate electrode. See figure 13.

Art Unit: 2815

With regard to Claim 75, Hause teaches a barrier layer (555) that comprises silicon nitride (column 5, lines 63-67 and column 6, line 1).

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 76 is rejected under 35 U.S.C. § 103 (a) as being unpatentable over Hause et.al. (U.S. Patent No. 6,255,703) in view of Maiti et.al. (U.S. Patent No. 6,049,114). With regard to Claim 76, Hause essentially teaches the claimed invention but fails to show the source/drain extension having a thickness of more than 400 angstroms. Maiti discloses a semiconductor device including source/drain extensions (26) having a depth of more than 400 angstroms (column 4, lines 39-42). See figures 11 and 19. Therefore, it would have been an obvious modification to someone with ordinary skill in the art, at the time of the invention, to modify the structure as taught by Hause to include an extension having a thickness of more than 400 angstroms in thickness, as suggested by Maiti, in order to enable the gate to control the channel reproducibly (column 4, lines 42-44)

Art Unit: 2815

***Response to Arguments***


3. Applicant's arguments with respect to claims 63-76 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Edgardo Ortiz (Art Unit 2815), whose telephone number is (703) 308-6183 or by fax at (703) 308-7724. In case the Examiner can not be reached by a direct telephone call, you might call Supervisor Eddie Lee at (703) 308-1690. Any inquiry of a general nature or relating to the status of this application should be directed to the Group 2800 receptionist whose telephone number is (703) 308-0956.

EO / AU 2815

8/21/03

  
**GEORGE ECKERT**  
**PRIMARY EXAMINER**